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PATENT SPECIFICATION

EXAMINER'S

COPY

DW 39

479,042

Application Date: July 29, 1936. No. 21012/36.

Complete Specification Left: July 28, 1937.

Complete Specification Accepted: Jan. 31, 1938.



PROVISIONAL SPECIFICATION

Improvements in or relating to Gas or other Fluid Pressure Governors

We, WILLIAM SUGG & COMPANY LIMITED, a company organised under the laws of Great Britain, of Ranelagh Works, Chapter Street, Westminster, London, S.W.1, and PHILIP CRAWFORD SUGG, British subject, of "South View," Pollards Hill East, Norbury, London, S.W.16, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to a gas or other fluid pressure governor of the type comprising a valve controlled by a diaphragm which is subjected to the gas pressure so that on any sudden rise in gas pressure in the system, the diaphragm is actuated to draw the valve member towards and preferably through its seating thereby cutting down the gas supply so that the pressure in the gas barrel beyond the outlet remains very nearly constant.

20 According to the present invention in a gas or other fluid pressure governor of the type set out, a seating is provided for co-operation with the diaphragm and against which the latter is normally biased and which is so arranged that when, upon a rise of pressure in the system sufficient to lift the diaphragm from its seating, a greater area of the diaphragm will become exposed to the pressure so that the diaphragm will remain in its displaced position even though the pressure may be reduced to a value below that which is normally insufficient to displace it from its seating.

35 By means of this invention it is possible to combine the usual gas governor with a cut-out device which enables the entire gas supply system automatically to be put out of or brought into action simply by causing a predetermined fall or rise in pressure in the supply according to the relative positions of the diaphragm and its seating. This is particularly advantageous, for example in the event of an air raid, since, assuming that the normal working pressure supply is X, by reducing the pressure, which is at this time operative on the whole area of the

membrane, until it is insufficient to support the membrane against its load, the diaphragm will fall, and by coming into contact with the annular seating cuts the gas off. The pressure can then be raised to the normal value without the valve opening because of the reduced area of the diaphragm, i.e. that area of the diaphragm lying within its seating, on which the pressure operates.

In one construction in accordance with this invention the combined governor and cut-out device comprises a casting with a barrel inlet and outlet for connection to the main supply pipe, passages being formed in the casting leading respectively from the inlet and outlet to a diaphragm chamber. This chamber is constituted by a cylindrical recess in the casting, which is closed at each end by detachable cap pieces, the cap piece at the upper end serving also to secure the diaphragm in position. In the recess is provided a shoulder screwed to receive a flange annulus, which flange has a diameter less than that of the recess and also provides the seating for the diaphragm. Attached to the diaphragm is a spindle, on the other end of which is formed a valve head of a size to just pass through the valve opening in the annulus with micrometric clearance, the diameter of the spindle permitting a normal flow of gas through the valve opening. The diaphragm may be loaded by means of a weight and conveniently this may be secured in position on the upper side of the diaphragm opposite the spindle by screwing it on to an extension of the valve spindle.

The inlet and outlet passages respectively, communicate with a chamber formed on the under and upper and outer sides of the annulus.

Dated this 29th day of July, 1936.

CARPMAELS & RANSFORD,

Agents for Applicants,

24, Southampton Buildings,
London, W.C.2.

COMPLETE SPECIFICATION

Improvements in or relating to Gas or other Fluid Pressure Governors

We, WILLIAM SUGG & COMPANY LIMITED, a company organised under the laws of Great Britain, of Ranelagh Works, Chapter Street, Westminster, London, S.W.1, and PHILIP CRAWFORD SUGG, British subject, of "South View," Pollards Hill East, Norbury, London, S.W.16, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a gas or other fluid flow control and fluid pressure governor device.

Pressure governors are known in which a valve controlled by a diaphragm, is subjected to the gas or other fluid pressure so that on any rise in gas pressure in the fluid system, the diaphragm is actuated to draw the valve member towards, and preferably through its seating, thereby cutting down the gas supply so that the outlet pressure in the gas system, i.e. on the outlet side of the diaphragm and valve remains very nearly constant.

We are also aware of a proposal in connection with a device for regulating gas burners having a main and pilot jet. In this device, which comprises a main and pilot valve, the one valve is made to open and the other to close, by suitably raising or lowering the pressure of the gas supply, the pressure acting on a diaphragm co-operating with a seating of smaller area so that when the pressure is sufficiently increased the diaphragm will be lifted from its seating to open the main valve, the other or pilot valve closing, while when the pressure is sufficiently lowered the other valve will open and the first or main valve closes.

The object of this invention is to combine in the one device valves for the control and governing of a gas supply or other fluid system.

According to the present invention a gas or other fluid flow control and fluid pressure governor valve device comprises a pressure control valve member, a diaphragm connected to the control valve member and which is subjected to the pressure in the system and adapted on a rise in pressure therein to move the control valve member in a direction to cut off or cut down the gas supply, and a valve seating, into engagement with which the diaphragm is biased to move

and whose area is less than that of the diaphragm and so arranged in relation to the biasing force that upon a predetermined drop in pressure in the fluid supply, the diaphragm will operate as a valve in conjunction with its seating to cut off the gas or other fluid supply, the diaphragm valve remaining closed upon the normal pressure being restored and until the pressure is sufficient to displace it.

By means of this invention it is possible to combine the usual gas governor with a cut-off device which enables the entire gas supply system automatically to be put out of or brought into action simply by causing a predetermined fall or rise in pressure in the supply according to the relative positions of the diaphragm and its seating. This is particularly advantageous, for example in the event of an air raid since, assuming that the normal working pressure supply is X, by reducing the pressure, which is at this time operative on the whole area of the membrane, until it is insufficient to support the membrane against its load, the diaphragm will fall, and by coming into contact with the annular seating cuts the gas off. The pressure can then be raised to the normal value without the valve opening because of the reduced area of the diaphragm, i.e. that area of the diaphragm lying within its seating, on which the pressure operates.

The invention is illustrated in the single figure of the accompanying drawing, this figure being a vertical sectional elevation. Referring to the drawing a casting 1 is provided with a screwed, in the trade termed a "barrel" inlet 2 and outlet 3 for connection to the main supply pipe, passages 4, 5 being formed in the casting and leading respectively from the inlet and outlet to a diaphragm member 6. This chamber is constituted by a cylindrical recess in the casting 1, which is closed at each end by detachable cap pieces 7, 8, the cap piece at the upper end serving also to secure a diaphragm 9 in position. In the recess is provided a shoulder screwed to receive a flanged annulus 10, in the form of a disc having a flange 11 and a valve opening 12, the flange 11 having a diameter less than that of the upper part of the recess and also providing a seating for the diaphragm 9 or for a plate 9¹ secured thereto. This flanged disc divides the diaphragm chamber 6 into two parts, one communicating with the inlet passage 4 and the other with

the passage 5. Attached to the diaphragm 9 is a spindle 13, on the other end of which is formed a coned valve head 14 of a size to just pass through the valve opening 12 in the annulus with micrometric clearance, the diameter of the spindle 13 permitting a normal flow of gas through the valve opening 12. The diaphragm may be loaded by means of a weight 15 and conveniently this may be secured in position on the upper side of the diaphragm by screwing it on to an extension of the valve spindle.

It will now be seen that in normal use the device will operate as a pressure governor, for change in the pressure of the gas supply from the inlet 2 will operate on the diaphragm 9 which in turn will control the position of the valve head 14 with reference to the valve opening 12. If now it is desired to cut off the supply of gas, the gas pressure is lowered to a value which is insufficient to support the loaded diaphragm 9 which latter will fall to engage the flange 11 and so cut off the supply of gas from the inlet part of the chamber 6 to the outlet part thereof. The area of the diaphragm now exposed to the gas pressure is that defined by the flange 11 and is smaller than when the diaphragm was out of contact with the flange and so the gas pressure can be restored to its normal value without raising the diaphragm 9 from the flange 11. Reestablishment of the gas supply, can be effected by increasing the gas pressure to a value which is a predetermined amount above the normal value and is sufficient, by operating on the reduced exposed area of the diaphragm, to lift the diaphragm away from contact with the flange 11 whereupon the gas pressure can be reduced to its normal pressure as this pressure now operates over the entire surface of the diaphragm.

It will be appreciated that in place of the form of lift valve 13 shown, any other normal type of valve suitable as a governor valve may be used, for example one not passing through the valve opening 12.

Having now particularly described and

ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A combination fluid flow control and fluid pressure governor valve device comprising the combination of a pressure control valve member, a diaphragm connected to the control valve member and which is subjected to the pressure in the system and adapted on a rise in pressure therein to move the control valve member in a direction to cut off or cut down the gas supply, and a valve seating, into engagement with which the diaphragm is biased to move and whose area is less than that of the diaphragm and so arranged in relation to the biasing force that upon a predetermined drop in pressure in the fluid supply, the diaphragm will operate as a valve in conjunction with its seating to cut off the gas or other fluid supply, the diaphragm valve remaining closed upon the normal pressure being restored and until the pressure is sufficient to displace it.

2. A device as claimed in claim 1 and in which the diaphragm valve seating is formed around a second seating adapted to co-operate with the pressure control valve member connected to the diaphragm.

3. A device as claimed in claim 2 and in which the two valve seatings are formed in a flanged disc member secured in the casing.

4. A device as claimed in claim 2 or 3 and in which the control valve member consists of a rod carried by the diaphragm and having a valve head passing through an aperture which constitutes the second valve seating.

5. A combination fluid flow control and fluid pressure governor device suitable for use in a gas system, substantially as described with reference to the accompanying drawing.

Dated the 28th day of July, 1937.

CARPMAELS & RANSFORD,

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